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Tear of Retinal Pigment Epithelium following YAG Laser Posterior Capsulotomy in a Patient on Anti-VEGF Treatment for AMD: Six Months' Follow-Up

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Key Words

Retinal pigment epithelium tear · YAG Laser · Age-related macular degeneration · Pigment epithelial detachment rupture · Ranibizumab

Abstract

Purpose: To present a rare case of retinal pigment epithelium (RPE) rupture following YAG laser posterior capsulotomy (YAG PC) in a patient with exudative age-related macular degeneration (AMD).

Materials and Methods: An 85-year-old pseudophakic male patient on ranibizumab 0.5 mg/0.05 ml treatment due to exudative AMD received YAG PC for dense posterior capsule opacification (PCO) in his right eye. The patient had received his last intravitreal ranibizumab injection 3 months before YAG PC; his macula appeared stable on fundoscopy and optical coherence tomography scans at repeated visits, but his vision deteriorated to counting fingers due to PCO.

Results: Following left eye posterior YAG PC, his best-corrected visual acuity (BCVA) improved to 6/12 (Snellen chart). Despite satisfactory visual results, the patient developed a parafoveal inferotemporal RPE rupture. A decision for further treatment with ranibizumab (0.5 mg/0.05 ml) intravitreal injections was made. After a total of 7 injections, the patient was clinically stable and his BCVA was 6/18 (Snellen chart).

Conclusions: RPE rupture is a well-known, serious complication in patients with exudative AMD, which often has devastating results on patients' vision. Offering YAG PC to those patients could lead to a rupture of the RPE even in cases which appear to be stable and well

controlled. Clinicians should be aware of this complication and inform the patients accordingly.

Introduction

Rupture of the retinal pigment epithelium (RPE) is a well-known complication of exudative age-related macular degeneration (AMD). For several decades, the characteristics and prevalence of RPE ruptures have been puzzling ophthalmologists. In 1981, Hoskin et al. [1] had already documented that the ripping of the RPE is a reasonably common complication in patients with RPE detachment and separation of the RPE from its basement membrane, while more recently the height of the RPE detachment and also its features have been implicated as predictive factors for possible rupture [2].

Case Report

In October 2010, an 85-year-old male patient presented at the Macular Clinic with symptoms of metamorphopsia and deterioration of vision in the right eye. The patient was pseudophakic bilaterally and had undergone uncomplicated cataract surgeries almost 1 year before his first visit to the Macular Clinic. Moderate posterior subcapsular opacification (PCO) was detected in the right eye and minimal PCO was seen in the fellow eye as well. On presentation, his best-corrected visual acuity (BCVA) on a Snellen chart was 6/36 in the right eye and 6/9 in the left. Clinical examination and ancillary imaging testing by means of fundus fluorescein angiogram and optical coherence tomography (OCT) led to the diagnosis of exudative AMD and the presence of an active vascularized pigment epithelial detachment (PED) with an occult choroidal neovascular membrane (CNVM) in the right eye and dry AMD in the left eye. The patient was offered the standard treatment of 3 monthly intravitreal ranibizumab (0.5 mg in 0.05 ml) injections.

Results

Following the initial loading dose of ranibizumab, the appearance of the macula on OCT improved significantly, but the persisting subretinal fluid on the OCT scans led to the decision to offer 2 further intravitreal injections to the patient. Following the fifth injection, the disease appeared to go into remission and there was no evidence of fresh bleeding or subretinal fluid in funduscopy or OCT, and only a shallow PED remained (fig. 1).

Unfortunately, the patient's BCVA in the right eye deteriorated further to counting fingers due to PCO. With the patient stable in repeated monthly visits over a period of 3 months and with no signs of reactivation of the CNVM such as new subretinal fluid or new bleeding, a decision was made to offer the patient YAG laser posterior capsulotomy (YAG PC) for his PCO. Following YAG PC with 20 shots of power between 1.8 and 2.5 mJ, the patient's BCVA in the right eye improved dramatically to 6/12 (Snellen chart). However, a parafoveal inferotemporal RPE tear with significant bleeding was evident on funduscopy (fig. 2). A clinical decision to offer two more ranibizumab (0.5 mg in 0.05 ml) injections in the right eye was made based on OCT findings of subretinal fluid and funduscopy. After the additional 2 injections, and a total of 7, the patient was

clinically stable and his BCVA in the right eye remained at 6/18 (Snellen chart) over a period of 6 months following the RPE tear. The fellow eye also remained clinically stable with a BCVA of 6/9 (Snellen chart) ([fig. 3](#)). In this patient's last clinic appointment though, some increase of subretinal fluid at the area of the tear, without affecting his BCVA, led to the clinical decision of offering 1 more ranibizumab injection.

The patient gave his informed consent for all material and medical records presented in this case report.

Discussion

Tears of the RPE in patients suffering from exudative AMD are a well-known, serious complication which can have a devastating effect on vision [1]. Although the overall incidence of RPE tears in large multicenter studies remains relatively low, ranging from 1.6 to 3.0% [3], there are some characteristics that could help recognize high-risk patients. The incidence of RPE tears seems to be significantly higher amongst patients with large and irregular fibrovascular PED, especially if there is a small ratio of CNVM size to PED size (<50%) [2, 4], and in this subgroup of AMD patients RPE tears could affect up to 16.8% [2]. Also, tears of the RPE tend to occur much more frequently in patients with occult subfoveal CNVM [5]. Furthermore, a strong positive correlation has been documented between the preinjection height of the vascularized PED and the possibility of an RPE tear. Chan et al. demonstrated that a PED height of more than 400 μm is a significant risk factor, predisposing to RPE tears, especially following intravitreal injections of anti-VEGF agents [2]. Regarding the possible adverse effect of the anti-VEGF injections in the development of RPE tears, current data describe a low risk of such a possibility, and if a tear of the RPE is to occur, it will do so within the first 18 weeks from initiation of treatment – probably due to other predisposing factors rather than as an effect of treatment [3, 5, 6].

In our case, the patient had a fibrovascular PED with a preinjection height of less than 400 μm . He appeared to respond very well to the ranibizumab (0.5 mg in 0.05 ml) intravitreal injections, and he remained stable without development of new subretinal fluid or bleeding for 3 months following the last injection prior to the YAG PC. PCO in this patient progressed significantly during the course of treatment and further follow-up, to a point that it was becoming increasingly difficult to clinically assess to patient. Unfortunately, despite significant improvement in vision after the YAG PC, the patient developed a tear of the RPE. To the best of our knowledge, this is the first case of such a complication of YAG PC in the literature. Further injections of ranibizumab (0.5 mg in 0.05 ml) managed to confine the adverse results of the RPE tear and preserve a reasonable BCVA in the patient's right eye, as has been suggested elsewhere in the literature [5].

We strongly believe the risk of an RPE tear has to be taken into account when the decision for YAG PC is made in patients suffering from AMD and on anti-VEGF treatment. It is unknown if precautions such as low power and few shots, together with a long period of the disease in remission are of any benefit to the patient undergoing this procedure. The decision to treat should be based on the patient's clinical condition and the degree of PCO. When vision is poor due to primarily dense PCO, treatment

should be offered; however, the possibility of an RPE tear should be taken into consideration.

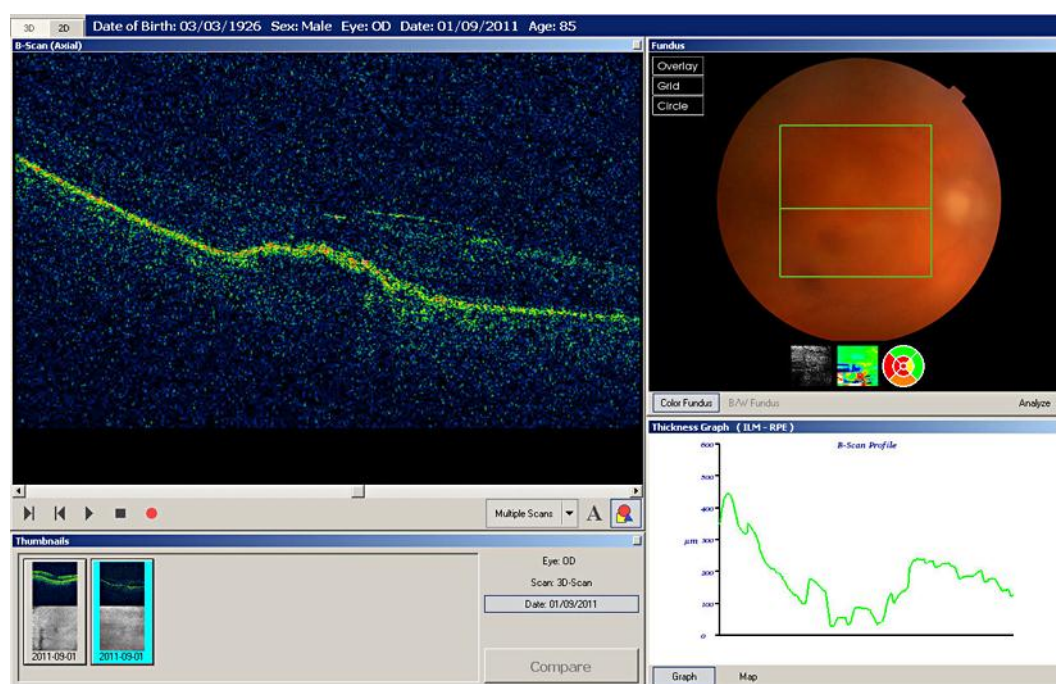


Fig. 1. Color photo and OCT scan before the YAG PC. Note the hazy fundal view and shallow PED.

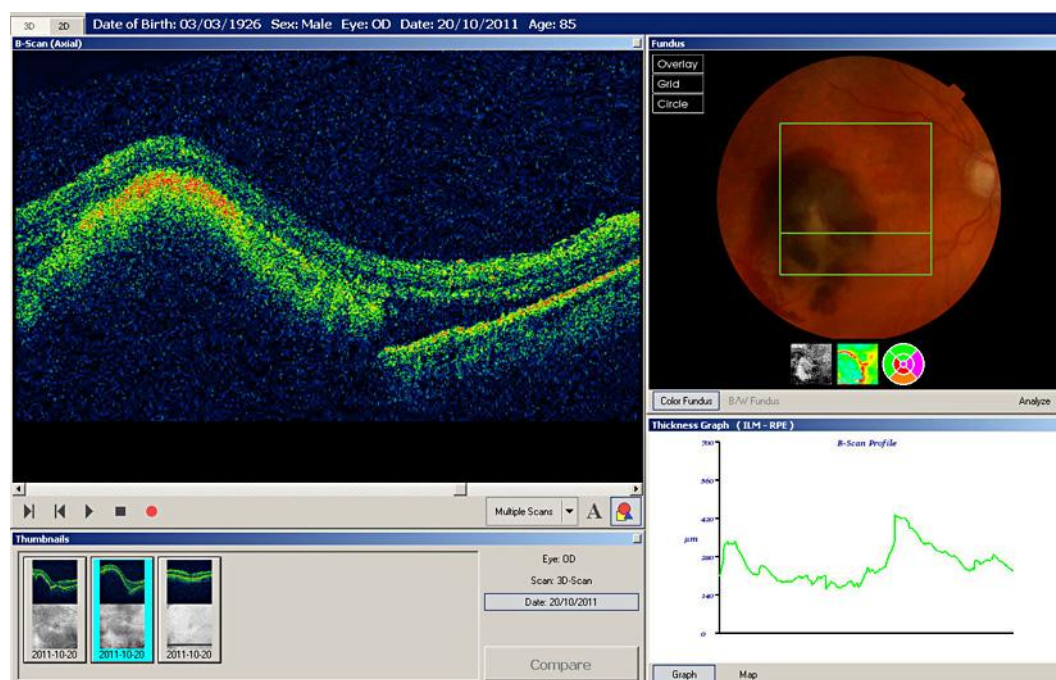


Fig. 2. Color photo and OCT scan after the YAG PC. Fundal view is clear but the large RPE tear inferotemporal to the macula is evident as well.

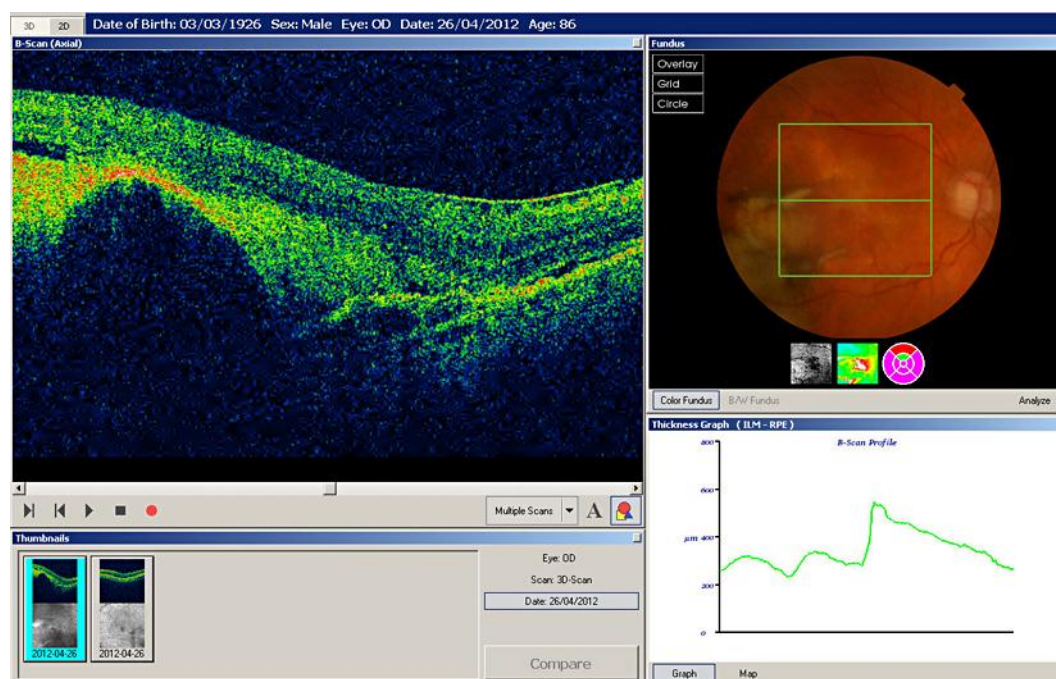


Fig. 3. Color photo and OCT scan at the 6-month follow-up. The patient is clinically stable and the RPE tear shows signs of fibrosis.

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